TETRA TECH

November 22, 2011

Mr. Roy Crossland
START Project Officer
U.S. Environmental Protection Agency, Region 7
901 North 5th Street
Kansas City, Kansas 66101

Subject: **Trip Report and Data Summary**
Removal Assessment Support, Dugan & Helterbrand Site, Marshfield, Missouri
CERCLIS ID: MOD86919248 (Archived)
U.S. EPA Region 7 START 3, Contract No. EP-S7-06-01, Task Order No. 0241
Task Monitor: Paul Doherty, EPA On-Scene Coordinator

Dear Mr. Crossland:

Tetra Tech EM Inc. is submitting the enclosed Trip Report and Data Summary for removal assessment sampling at a residential property and children's play area near the archived Dugan & Helterbrand site in Marshfield, Missouri. If you have any questions or comments regarding this submittal, please contact the project manager at (816) 412-1771.

Sincerely,

for Jenna Mead, RG
START Project Manager

Ted Faile, PG, CHMM
START Program Manager

Enclosures

40533219

Tetra Tech EM Inc.
415 Oak Street, Kansas City, MO 64106
Tel 816.412.1741 Fax 816.410.1748 www.tetratech.com

X9004.11.0241.000

TRIP REPORT AND DATA SUMMARY

FOR REMOVAL ASSESSMENT SUPPORT
DUGAN & HELTERBRAND SITE
MARSHFIELD, MISSOURI
CERCLIS ID: MOD86919248 (Archived)

Superfund Technical Assessment and Response Team (START) 3
Contract No. EP-S7-06-01, Task Order 0241

Prepared For:

U.S. Environmental Protection Agency
Region 7
901 North 5th Street
Kansas City, Kansas 66101

November 22, 2011

Prepared By:

Tetra Tech EM Inc.
415 Oak St.
Kansas City, Missouri 64106
(816) 412-1741

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APPENDICES

TABLES

1.0 INTRODUCTION

The U.S. Environmental Protection Agency (EPA) Region 7 Superfund Division tasked Tetra Tech EM Inc., (Tetra Tech), under Superfund Technical Assessment and Response Team (START) 3 Contract No. EP-S7-06-01, Task Order No. 241, to provide removal assessment support at the Dugan & Helterbrand (D&H) site in Marshfield, Webster County, Missouri. The D&H site was entered into the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) in July 1985 as identification number MOD086919248 (EPA 2011c).

This site is a former silver recovery facility in a mixed residential-industrial area of southwestern Marshfield. A removal action occurred at the D&H site in 1990-91, following a history of complaints and violations regarding waste management practices at the facility (Ecology & Environment, Inc. [E&E] 1991b). The site was archived from CERCLIS in 1994 (EPA 2011c). In March 2011, a private citizen residing at 470 George Street, about 150 feet northwest of the former D&H facility, contacted the Missouri Department of Natural Resources (MDNR) seeking information on the site. Assurance was desired that contamination from the D&H site was not present in children's play areas, including a drainage swale, behind the residence. MDNR referred the request to EPA (MDNR 2011). The residence is one of nine rental duplexes that were constructed on the east side of George Street around 2000 (Webster County 2011). The tenant at 470 George Street is also the leasing manager for the duplexes. Access was obtained from the property owner prior to field activities.

The purpose of this removal assessment was to determine whether metals and cyanide contamination associated with the D&H site were present in surface soils at this nearby residence at levels that could present a health hazard to young children. Based on topography and file review, the residence appeared to be upgradient of runoff from the D&H site; however, it was uncertain whether drainage may have been altered by development, or whether stormwater could back up in this area.

2.0 SITE BACKGROUND INFORMATION

Information regarding the site's location, description, and relevant investigation history is discussed in this section.

2.1 LOCATION AND DESCRIPTION

The D&H site is located in Section 9, Township 30 North, Range 18 West. The approximate geographic coordinates for the former D&H facility are latitude 37.33270° north and longitude 92.92260° west (see Figure 1 in Appendix A). The site is located in the southwestern part of the City of Marshfield, Webster County, which is about 20 miles northeast of Springfield, Missouri. During a 1990-1991 EPA-funded removal action, the facility address was reported to be 190 George Street. The current address for the former D&H property could not be determined; however, it is immediately east of the southernmost duplex (490/492 George Street) and is accessed by a gravel road between the duplex and a business (Marshfield Drayage trucking company) at 500 George Street. This access road is just east of the intersection of George Street and Warren Avenue.

Review of Google Earth aerial photographs indicated the D&H site currently consists of three buildings situated about 150 feet east of George Street. Residential properties are located on either side of George Street north of the facility, with older single-family homes on the west side of the road. Marshfield Drayage is immediately southwest of the former D&H facility, and the access road also provides access to the back of that building. Several large industrial facilities are located on George Street south and southwest of the former D&H facility. Northeast-southwest trending Burlington Northern railroad tracks cross George Street just south of Marshfield Drayage, and this railroad right-of-way forms the southeastern D&H property line. Undeveloped land (formerly pasture) is present north of the D&H site. Google Earth aerial photographs suggest the facility was generally unused between 1995 and 2010. During September 2011 post-removal field activities, the western D&H building appeared to be used for heavy equipment or warehouse storage. No fence separates the site from the neighboring properties.

2.2 GEOLOGY AND HYDROGEOLOGY

Webster County is located in the Ozark uplift region of Missouri. Marshfield is on a topographic divide, with drainage radiating away from the City in all directions. In southwestern Marshfield, the drainage is generally toward southwest-flowing streams. Elevation at the D&H site is about 1,485 feet above mean sea level, and surface water drainage is southward towards Turnbo Creek, about 0.8 mile south of the site (U. S. Geological Survey 1982). The City of Marshfield Public Water Supply (PWS) serves a population of 7,250 from three wells, ranging in depth from 1,300 to 1,450 feet below ground surface (bgs) and completed in the Eminence and Potosi Dolomites of the Ozark Aquifer (Center for Applied Research and Environmental Systems [CARES] 2011, EPA 2011b). The closest of these wells is about 1,000 feet west of the site; the other two wells are about 1.2 miles northwest and 1 mile east of the site.

Soils in the Marshfield area are part of the Viraton-Gepp-Wilderness association of soils that formed in loess and cherty and clayey dolomite residuum on gentle to steep slopes of uplands. These soils are deep and moderately well-drained to well-drained (U.S. Department of Agriculture [USDA] 1990). Soils in the residential area north of the former D&H facility are Plato silt loam, having 2- to 5-percent slopes. These are deep, gently sloping, somewhat poorly drained soils that formed on ridges in uplands. The upper 6 inches is typically a friable, dark grayish brown silt loam that becomes more clayey, mottled, and cherty with depth.

The *Missouri Environmental Geology Atlas* (MEGA) indicates the uppermost bedrock at the site belongs to the Mississippian-aged Kinderhookian Series, which is comprised of limestones and shales. In general, Mississippian-aged bedrock is present southwest of Marshfield, with underlying Ordovician-aged dolomite bedrock occurring as the uppermost bedrock to the northeast. About 20 feet of residuum overlies the bedrock. Domestic wells in the area have static water levels (SWL) between about 75 and 100 feet bgs, while monitoring wells in southwestern Marshfield reportedly have SWLs of about 5-10 feet bgs. No lead or zinc mines or karst features such as sinkholes or springs are indicated for the immediate area. The closest zinc mine identified was about 3.5 miles southeast of Marshfield (Marshfield Shaft). MEGA identifies one sinkhole in Marshfield, located about 0.65 mile north of the site. The closest spring to the site is at the head of Turnbo Creek, about 0.9 mile southeast of the site (MDNR 2007).

2.3 FACILITY OPERATIONS

D&H operated a silver recovery facility at the site from 1980 until July 1990. The silver was recovered from emulsions on photographic, lithographic, and radiologic film backings (cellulose acetate or plastic) using a cyanide stripping/electroplating process. In 1985, D&H changed the process to enzyme-extraction, reducing the cyanide process to about 10 percent of its operations. During its period of operation, D&H received numerous warnings and citations from MDNR and the City of Marshfield regarding its waste management practices. D&H reportedly disposed of cyanide-contaminated film chips in the city landfill and discharged cyanide-contaminated liquid into city sewers. The deaths of several head of cattle in an adjoining pasture and fish kills in Turnbo Creek were believed to have been connected to contamination from the site. In July 1990, after repeated violations of city discharge permit regulations, D&H's discharge permit was revoked, and the facility was disconnected from the sewer system (Ecology and Environment, Inc. [E&E] 1991b).

2.4 PREVIOUS INVESTIGATIONS AND REMOVAL ACTION

MDNR conducted a Preliminary Assessment (PA) in 1985 and a Site Inspection (SI) in 1987 (EPA 2011c). In August 1990, in response to complaints from local officials and Burlington Northern regarding alleged cyanide-waste runoff from the site, MDNR conducted an inspection and gathered sufficient evidence to warrant a removal action. At that time, the facility consisted of four buildings. Process operations were conducted in two large buildings at the east and west sides. A tool shop and a smelter shed (no longer present) were located between the two production buildings.

On September 10, 1990, MDNR's cleanup contractor, Riedel Environmental Services (RES), removed about 50 cubic yards of visibly contaminated soil from a drainage ditch south of the site, located on a Burlington Northern right-of-way. The excavated soil was temporarily stored on site. MDNR then requested that EPA take the lead for a removal action at the site. EPA contacted D&H, requesting it take responsibility for site cleanup activities. D&H failed to respond, and EPA commenced site cleanup using RES under the Emergency Response Cleanup Services (ERCS) contract (E&E 1991b). E&E, EPA's Technical Assistance Team (TAT) contractor, performed sampling and provided documentation of the removal activities, which occurred between September 1990 and October 1991.

At the time EPA assumed the lead for the removal action, approximately 40,000 gallons of cyanide solutions was present at the site in 14 processing vats, storage tanks, and drums. The solutions contained concentrations as high as 14,600 parts per million (ppm) of cyanide, 18,300 ppm of silver, and 80,600 ppm of chloride. In addition, about 150 drums (containing various liquids, solids, and sludges) and piles of film chips were located throughout the facility. Analyses of liquid wastes indicated much higher concentrations of cyanide and metals were present in the eastern building than the western building—where the enzyme–extraction process was used.

A total of 50,000 gallons of hazardous waste (cyanide solutions plus decontamination solutions generated during the removal) was pumped from the on-site storage containers and transported to CyanoKem's facility in Detroit, Michigan.

Unpaved areas of the site were subdivided into two grids (generally northern and southern areas), and surface soils were sampled. Samples were also collected from the drainage ditch along the railroad right-of-way south of the site, including a 190-foot segment that had been excavated by the State. The excavated segment appears to have generally spanned the length from the western property line to about

midway between the two production buildings. The excavation width and depth are unknown (E&E 1991b).

Table 1 presents the analytical results for the surface soil samples collected following removal activities at the D&H site. Results are for the calculated 95% upper confidence limit, rather than individual sample results. These values are compared to the current EPA Regional Screening Levels (RSL) for residential and industrial soils (EPA 2011a) and the Reference Dose (RfD) screening concentrations from the Superfund Chemical Data Matrix (EPA 2004).

TABLE 1

SUMMARY OF ANALYTICAL RESULTS AFTER 1990-1991 REMOVAL ACTION
DUGAN & HELTERBRAND SITE, MARSHFIELD, MISSOURI

Location	Total Cyanide	Total Lead	Total Chromium	Total Silver
Soil Samples Collected from 0-2 inches bgs (Concentrations in mg/kg)				
190-foot section of south drainage ditch; post-excavation	14.9	74.1	48.5	8.9
220-foot section of south drainage ditch; east of George St.	17.0	124.0	24.3	79.0
250-foot section of south drainage ditch; west of George St.	9.9	88.7	42.0	13.6
Section 001; unpaved area north of D&H buildings	2.0	15.5	11.3	90.3
Section 002; unpaved area south of D&H buildings	1.8	30.3	14.0	96.4
Background (0.25 mile north of site)	<1	49.0	16.4	1.4
Soil Samples Collected from 0-12 inches bgs (Concentrations in mg/kg)				
Concrete pad between buildings; composited sample	25.8	26.5	26.4	6.7
Below concrete at East Building	63.7	26	20.1	11.6
Below concrete at West Building	136	23	30.9	21.6
Three times background	>1	147	49.2	4.2
RSL – residential soil	1,600	400	NE	390
RSL – industrial soil	20,000	800	NE	5,100
SCDM RfD	1,600	NE	230	390

Notes:

Results presented are 95% Upper Confidence Limit calculated for individual areas.

bgs Below ground surface
D&H Dugan & Helterbrand
mg/kg Milligrams per kilogram (parts per million)
NE Not established
RfD Reference Dose Screening Concentration
RSL Regional Screening Level (EPA 2011a)
SCDM Superfund Chemical Data Matrix (EPA 2004)

Special wastes, which included excavated soils, film chips, and piping contaminated with low levels of cyanide and metals, were stored in roll-off boxes pending disposal. Upon receipt of a special permit, disposal of 15 loads (about 300 cubic yards) of special waste occurred at the City of Springfield landfill.

In addition, about 500 drums of hazardous wastes (such as sludge bottoms and cyanide solutions) were shipped to Rollins Environmental in Deer Park, Texas, for incineration.

The vats and interior of the building were steam cleaned, and two sumps were installed in a concrete slab between the two main process buildings to collect cyanide-contaminated water from under the floors or foundations. The collected liquids were pumped to temporary storage tanks for sampling. Samples indicated these liquids contained 25 to 100 ppm of cyanide. EPA used the on-site vats to treat the cyanide-contaminated sump liquids using an alkali-chlorination process. The liquids were then discharged to the city sewer. As of June 1991, four 85-gallon overpack drums containing corrosive solids remained at the facility awaiting shipment (E&E 1991b). Information verifying final removal of these overpack drums was not available for review. A report detailing subsurface soil and groundwater sampling at the site as part of the removal action was referenced in the summary report for the removal action, but it was not available for review.

In 1991, a site in Northview, Missouri, about 5 miles southwest of Marshfield that had been used from about 1974 to 1980 by D&H, was also investigated by EPA. EPA determined that no removal was warranted at the Northview property (E&E 1991a). Federal enforcement activities continued at the D&H site in Marshfield until December 1994, when EPA archived the site (EPA 2011c).

3.0 SITE ACTIVITIES

Soil sampling activities were performed under Analytical Services Request (ASR) number 5479 by EPA On-scene Coordinator Paul Doherty and START team member (STM) Jenna Mead on September 13, 2011. The drainage swale where sampling occurred is approximately 30 feet east of the residence at 470 George Street, and is immediately east of trees marking the back property line. This swale is broad and shallow, and had been cleared and mowed behind the residence to increase the play area for the resident's two small children. A slide and a child's swimming pool had been placed in the swale. An unfenced hayfield is east of the swale. No fences or other barricades separate the yard, swale, or hayfield from the former D&H facility.

A total of eight grab samples were collected about every 20-25 feet along north-south transects across the backyard and in the drainage swale. Three samples were collected from the backyard play area between the northern property line and the middle of the backyard for the adjoining duplex (472 George Street) to the south. Five samples were collected from the drainage swale immediately east of the back property line. Three of these samples were collected from the mowed (play area) part of the drainage swale. The other

two samples were collected from unmowed areas at either end (see Appendix A, Figure 2). A ninth soil sample was collected from the swale for background comparison, approximately 650 feet north of the duplex. Global positioning system (GPS) coordinates were recorded at each location sampled. A background sample was also collected from the drainage swale area about 650 feet north (upgradient) of the residence.

Sample locations are summarized in Table 2 and depicted on Figure 2. A copy of START's logbook is provided in Appendix B.

TABLE 2

SOIL SAMPLE SUMMARY – SEPTEMBER 2011
DUGAN & HELTERBRAND SITE, MARSHFIELD, MISSOURI

Sample Number	EPA Number	Location Notes
SS-1	5479-4	South backyard (east of patio for adjoining 472 George Street unit)
SS-2	5479-3	Center backyard (470 George Street)
SS-3	5479-5	North backyard (470 George Street)
SS-4	5479-1	North swale (unmowed)
SS-5	5479-7	North swale (mowed)
SS-6	5479-6	Center swale
SS-7	5479-8	South swale (mowed)
SS-8	5479-2	South swale (unmowed)
SS-9 (Bkg)	5479-9	Drainage swale, about 100 feet south of W. Washington St.

Notes:

Bkg	Background
EPA	U.S. Environmental Protection Agency
SS	Soil sample

Soil samples were collected from a depth of 0-2 inches bgs using disposable stainless steel spoons or decontaminated stainless steel trowels. The soil samples were homogenized in ziplock plastic bags or aluminum pie pans and transferred to 32-ounce, wide-mouth glass jars. Sample containers were placed in a cooler and maintained at a temperature equal to or less than 4 degrees Celsius pending delivery to the EPA Region 7 laboratory.

On September 14, 2011, the samples were hand-delivered by START to the EPA Region 7 laboratory in Kansas City, Kansas, for metals (including mercury) and cyanide analyses. Standard turnaround times were requested for all samples. Copies of the sample field sheets and chain-of-custody forms are included as Appendix D. No deviations from the Quality Assurance Project Plan (QAPP) occurred.

4.0 ANALYTICAL DATA SUMMARY

Table 3 presents an analytical data summary for metals detected in the soil samples. The complete analytical data package is included in Appendix E. The common minerals calcium, magnesium, potassium, and sodium were detected but not included in this table. No silver was detected in the samples above detection limits of 4-4.7 milligrams per kilogram (mg/kg).

No total cyanide was detected in any soil sample above detection limits of 0.254 to 0.525 mg/kg.

Arsenic was detected in three samples (including background) at concentrations slightly exceeding detection limits of 5.1-5.9 mg/kg. Arsenic was detected at 5.9 mg/kg in the background sample (SS-9), collected about 650 feet north of the residence, and at 7.6 and 6.8 mg/kg in the two southernmost samples (SS-7 and SS-8) from the drainage swale east of the residence. These concentrations exceed EPA's RSL of 0.39 mg/kg for arsenic in residential soil (EPA 2011a), and cancer risk (CR) screening concentration 0.43 mg/kg in the Superfund Chemical Data Matrix (SCDM) (EPA 2004); however, they are less than the U.S. Geological Survey (USGS) reported average background arsenic concentration of 8.928 mg/kg for Webster County (USGS 2010). Because the concentrations detected at SS-7 and SS-8 are less than three times the concentration detected in the background sample, and because they are below the reported average concentration for Webster County, they are likely representative of naturally occurring levels and unrelated to activities at the D&H site.

The cadmium concentration in SS-7 (46.6 mg/kg) slightly exceeds the 39 mg/kg CR screening concentration from SCDM (EPA 2004), but does not exceed three times the concentration detected in the background sample (47.6 mg/kg in SS-9). Consequently, the cadmium concentration in sample SS-7 is considered unrelated to any release from the D&H facility. No USGS average background cadmium level has been established for Webster County.

No other metals were detected at concentrations that exceed health-based benchmarks or three times background concentrations. A removal site evaluation form is included as Appendix F to this report.

TABLE 3

ANALYTICAL DATA SUMMARY FOR SOIL SAMPLES – SEPTEMBER 2011
DUGAN & HELTERBRAND SITE, MARSHFIELD, MISSOURI

Sample Number	EPA Sample Identification	Aluminum	Arsenic	Barium	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Nickel	Vanadium	Zinc
		Milligrams per kilogram (mg/kg)													
SS-1	5479-4	13,500	5.1 U	116	35.7	22.7	11.7	15.8	15,500	23	782	0.0309	9	27.3	31.3
SS-2	5479-3	12,700	5.1 U	114	37.2	30.4	14	7.1	17,500	26.2	805	0.0375	7	31.9	23.8
SS-3	5479-5	13,200	5.1 U	101	32.3	18.3	10.1	6.7	14,900	20	676	0.0229	7.3	25.6	26.4
SS-4	5479-1	13,400	5.9 U	143	33.4 J	18.6	8.0	20.6	13,800	49.4	712	0.0819	8.5	24.9	87.5
SS-5	5479-7	11,500	5.4 U	138	31	17.6	7.5	20	13,100	36.6	748	0.0669	7.8	22.4	74.1
SS-6	5479-6	10,800	5.2 U	130	31.7	15.5	8.9	18.2	13,200	33.9	761	0.066	7.5	21.5	62.8
SS-7	5479-8	10,800	**7.6**	120	**46.6**	37.7	10.2	17.4	19,000	38.2	878	0.0771	7.6	38.3	62
SS-8	5479-2	9,950	**6.8**	111	37.9	24.1	9.6	17	16,400	37.5	725	0.0742	6.5	29.1	80.4
SS-9 (Site Background)	5479-9	17,200	**5.9**	157	**47.6**	22.2	14.3	19.2	21,500	73.3	423	0.0566	19.5	27.4	117
Three Times Site Background		**51,600**	**17.7**	**471**	**142.8**	**66.6**	**42.9**	**57.6**	**64,500**	**219.9**	**1,269**	**0.1698**	**58.5**	**82.2**	**351**
USGS Webster County Background		**21,820**	**8.928**	**NE**	**NE**	**NE**	**NE**	**10.495**	**23,140**	**26.585**	**993.194**	**0.022**	**NE**	**NE**	**56.434**
EPA Residential RSL		**77,000**	**0.39**	**15,000**	**70**	**NE**	**23**	**3,100**	**55,000**	**400**	**1,800**	**10**	**1,500**	**390**	**23,000**
SCDM Reference Dose Screening Concentration		**NE**	**23**	**5,500**	**39**	**230**	**NE**	**NE**	**NE**	**NE**	**11,000**	**23**	**1,600**	**550**	**23,000**
SCDM Cancer Risk Screening Concentration		**NE**	**0.43**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**

Notes:

Bold font indicates the concentration exceeds a benchmark value.

EPA	U.S. Environmental Protection Agency
J	Estimated concentration
NE	Not established
RSL	Regional Screening Level (EPA 2011a)
SCDM	Superfund Chemical Data Matrix (EPA 2004)
SS	Soil Sample
U	The analyte was not detected at or above the reporting limit indicated
USGS	U.S. Geological Survey

5.0 REFERENCES

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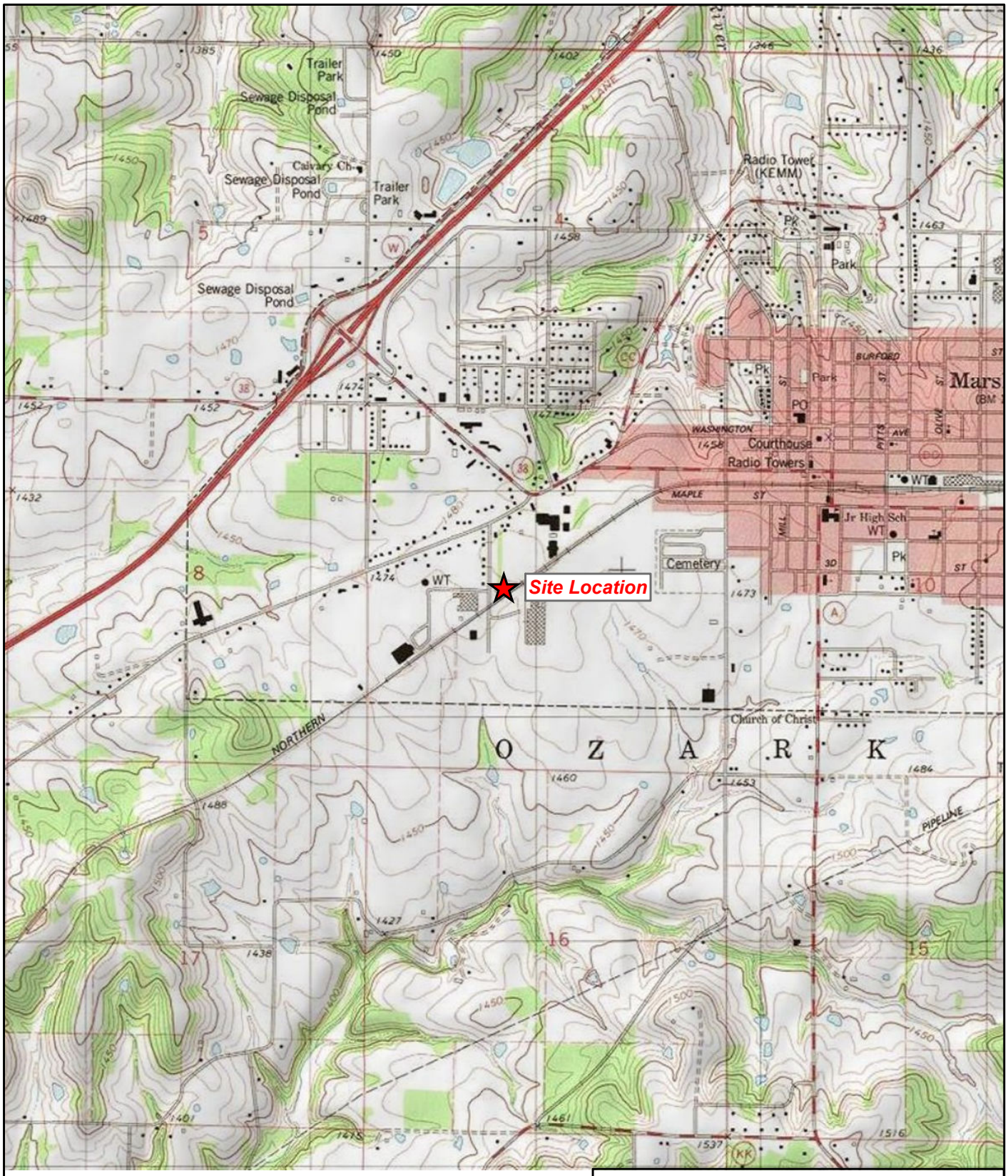
APPENDIX A

FIGURES



N

0 1,000 2,000

Feet

Source: USGS Marshfield, Missouri 7.5 Minute Topo Quad, 1982

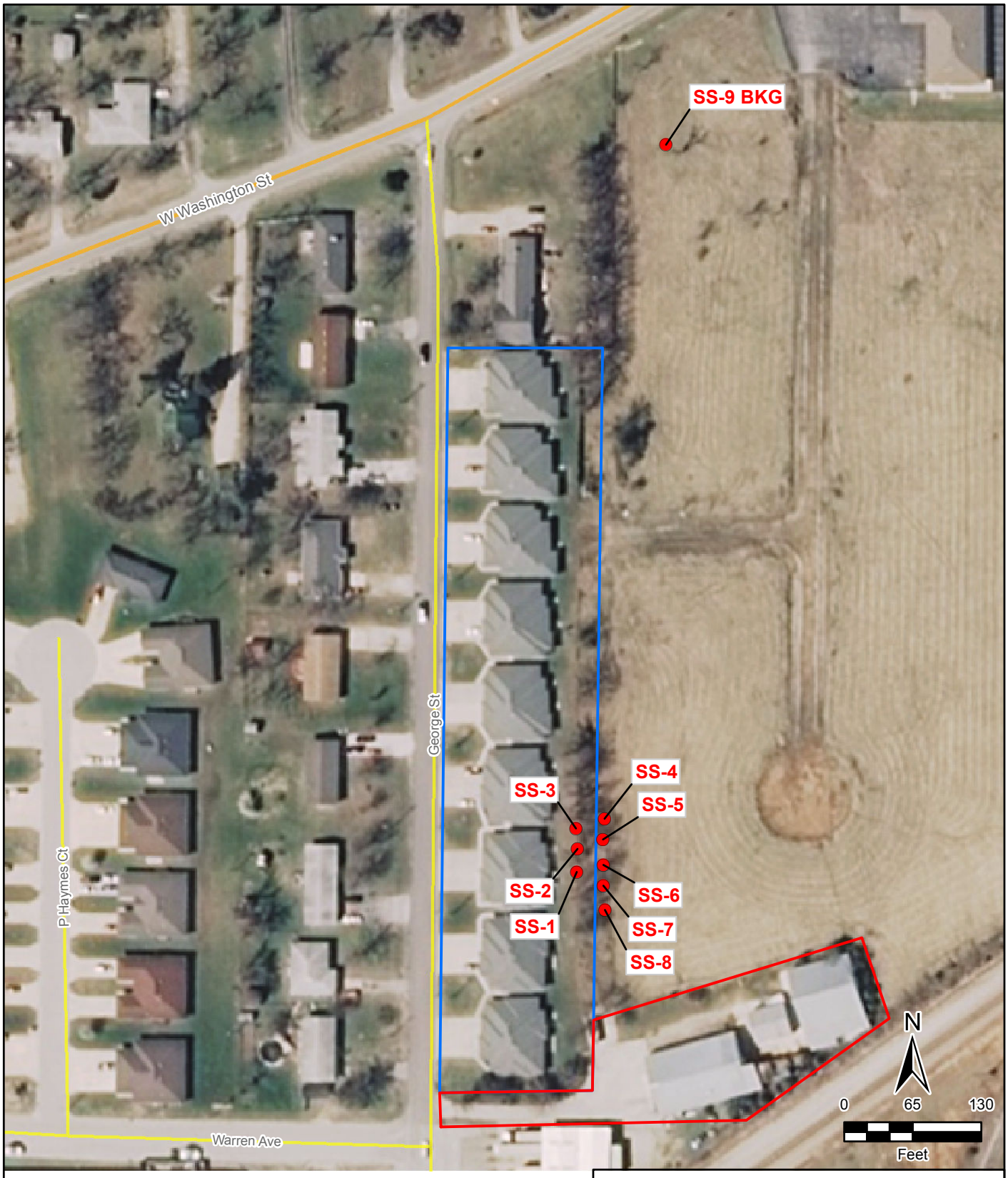
Dugan and Helterbrand Site
Marshfield, MO

Figure 1
Site Location Map

TETRA TECH EM INC.

Date: 08/01/11 Drawn By: Nick Wiederholt Project No: X9004.L.11.0241.000

X:\G\9004\0241\000\Projects\mxd\Figure1.mxd



Legend

- Soil sample location
- Major road
- Street
- BKG Background
- SS Soil sample
- Approximate property boundary - Dugan and Helterbrand
- Approximate property boundary - rental duplex property

Source: HSIP Gold, 2007; MSDIS 2 foot aerial imagery, 2008

Dugan and Helterbrand Site
Marshfield, MO

Figure 2
Sample Location Map

TETRA TECH EM INC.

Date: 10/21/11 Drawn By: Nick Wiederholt Project No: X9004.L.11.0241.000

X:\G\9004\0241\000\Projects\mxd\Figure2_102111.mxd

APPENDIX B

LOGBOOK

"Outdoor writing products...
...for outdoor writing people."

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Dugan + Helterbrand
Marshfield, MO

9-13-11

0700 JMead + P. Doherty meet @ cave. Depart for site in Marshfield, MO.

1025 Arrive @ 470 George duplex. Met Jennifer Smith leasing agent for duplexes also is tenant @ 470 + called State. She showed us back play area which has been extended into drainage ditch

1045 Collect SS-4 @ N end ditch 37.33343, -92.92294

1050 Collect SS-8 @ South end of ditch 37.33317 -92.92284

1053 Collect SS2 @ Center back yard

~~1055~~ 37.33327, -92.92294

1100 Collect SS1 S of backyard 37.33326, -92.92290

1102 Collect SS3 N end backyard 37.33338, -92.92304

1109 Collect SS6 middle ditch GPS 37.33328 92.92290

1111 Collect SS5 N 2nd ditch. 37.33333 92.92290

1116 Collect SS-7 2nd from S ditch 37.33326, -92.92290

1125 Collect SS-7 - Bldg. 37.33518 -92.92276

1152 Depart Marshfield, ~~1220~~ 1230 Lunch @ Springfield

~~1530~~ Return to KC cave. (Get gas first)

1550 Return to KCR office

Jennifer Mead 9-13-11

APPENDIX C

PHOTOGRAPHIC LOG

Dugan & Helterbrand Site
Marshfield, Missouri

TETRA TECH PROJECT NO. X9004.11.0241.000 DIRECTION: North	DESCRIPTION	This photograph shows duplexes on George Street north of access road to former Dugan & Helterbrand facility.	1
	CLIENT	Environmental Protection Agency - Region 7	DATE 9/13/11
	PHOTOGRAPHER	Jenna Mead	

TETRA TECH PROJECT NO. X9004.11.0241.000 DIRECTION: Southeast	DESCRIPTION	This photograph shows view of former D&H facility from backyard of residence at 470 George Street.	2
	CLIENT	Environmental Protection Agency - Region 7	DATE 9/13/11
	PHOTOGRAPHER	Jenna Mead	

Dugan & Helterbrand Site
Marshfield, Missouri

TETRA TECH PROJECT NO. X9004.11.0241.000 DIRECTION: South	DESCRIPTION	This photograph shows backyard play area at 470 George Street duplex and locations for surface soil (SS) samples.	3
	CLIENT	Environmental Protection Agency - Region 7	DATE 9/13/11
	PHOTOGRAPHER	Jenna Mead	

TETRA TECH PROJECT NO. X9004.11.0241.000 DIRECTION: Southeast	DESCRIPTION	This photograph shows view of former eastern production building and central tool shop at D&H site.	4
	CLIENT	Environmental Protection Agency - Region 7	DATE 9/13/11
	PHOTOGRAPHER	Jenna Mead	

Dugan & Helterbrand Site
Marshfield, Missouri

TETRA TECH PROJECT NO. X9004.11.0241.000 DIRECTION: Southeast	DESCRIPTION	This photograph shows former D&H western production building. Note the drainage swale has been mowed to increase the play area.	5
	CLIENT	Environmental Protection Agency - Region 7	DATE 9/13/11
	PHOTOGRAPHER	Jenna Mead	

TETRA TECH PROJECT NO. X9004.11.0241.000 DIRECTION: Southeast	DESCRIPTION	This photograph shows play area in drainage swale east of residence at 470 George Street. Former D&H facility shown in distance.	6
	CLIENT	Environmental Protection Agency - Region 7	DATE 9/13/11
	PHOTOGRAPHER	Jenna Mead	

Dugan & Helterbrand Site
Marshfield, Missouri

TETRA TECH PROJECT NO. X9004.11.0241.000 DIRECTION: Southwest	DESCRIPTION	This photograph shows view from drainage swale of trees along the eastern property line and backyard of residence at 470 George Street.	7
	CLIENT	Environmental Protection Agency - Region 7	DATE 9/13/11
	PHOTOGRAPHER	Jenna Mead	

APPENDIX D

CHAIN-OF-CUSTODY FORMS AND FIELD SHEETS

CHAIN OF CUSTODY RECORD
ENVIRONMENTAL PROTECTION AGENCY REGION VII

ACTIVITY LEADER(Print)	NAME OF SURVEY OR ACTIVITY	DATE OF COLLECTION (DAY / MONTH / YEAR)	SHEET
Paul Doherty	Dugan-Helterbrand Post RD	13 / 9 / 11	1 of 1

CONTENTS OF SHIPMENT

SAMPLE NUMBER	TYPE OF CONTAINERS: CUBITAINER	32 oz BOTTLE	BOTTLE	BOTTLE	VOA SET (2 VIALS EA)	SAMPLED MEDIA: water	soil	sediment	dust	other	RECEIVING LABORATORY REMARKS OTHER INFORMATION (condition of samples upon receipt other sample numbers, etc.)
	NUMBERS OF CONTAINERS PER SAMPLE NUMBER										
79											
5426-1		1					X				
-2		1									
-3		1									
-4		1									
-5		1									
-6		1									
-7		1									
-8		1									
-9		1					X				

ADR Completed

DESCRIPTION OF SHIPMENT

1 PIECE(S) CONSISTING OF _____ BOX(ES)

X ICE CHEST(S); OTHER _____

MODE OF SHIPMENT

_____ COMMERCIAL CARRIER: _____

_____ COURIER

X SAMPLER CONVEYED

_____ (SHIPPING DOCUMENT NUMBER)

PERSONNEL CUSTODY RECORD

RELINQUISHED BY (SAMPLER)	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
Jenna Mead ☐ SEALED ☐ UNSEALED [X]	9/14/11	1020	RDWiggam ☐ SEALED ☐ UNSEALED [X]	Rec'd at lab
RELINQUISHED BY ☐ SEALED ☐ UNSEALED	DATE	TIME	RECEIVED BY ☐ SEALED ☐ UNSEALED	REASON FOR CHANGE OF CUSTODY
RELINQUISHED BY ☐ SEALED ☐ UNSEALED	DATE	TIME	RECEIVED BY ☐ SEALED ☐ UNSEALED	REASON FOR CHANGE OF CUSTODY

7-EPA-9262(Revised 5/85)

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 5479 **Sample Number:** 1 **QC Code:** __ **Matrix:** Solid **Tag ID:** 5479-1-__

Project ID: PD07FQ01 **Project Manager:** Paul Doherty
Project Desc: Dugan Helterbrand Post-Removal Assessment
City: Marshfield **State:** Missouri
Program: Superfund
Site Name: 07FQ DUGAN & HELTERBRAND - SITE EVALUATION/DISPOSITION **Site ID:** 07FQ **Site OU:** 00

Location Desc: _____

External Sample Number: SS-4

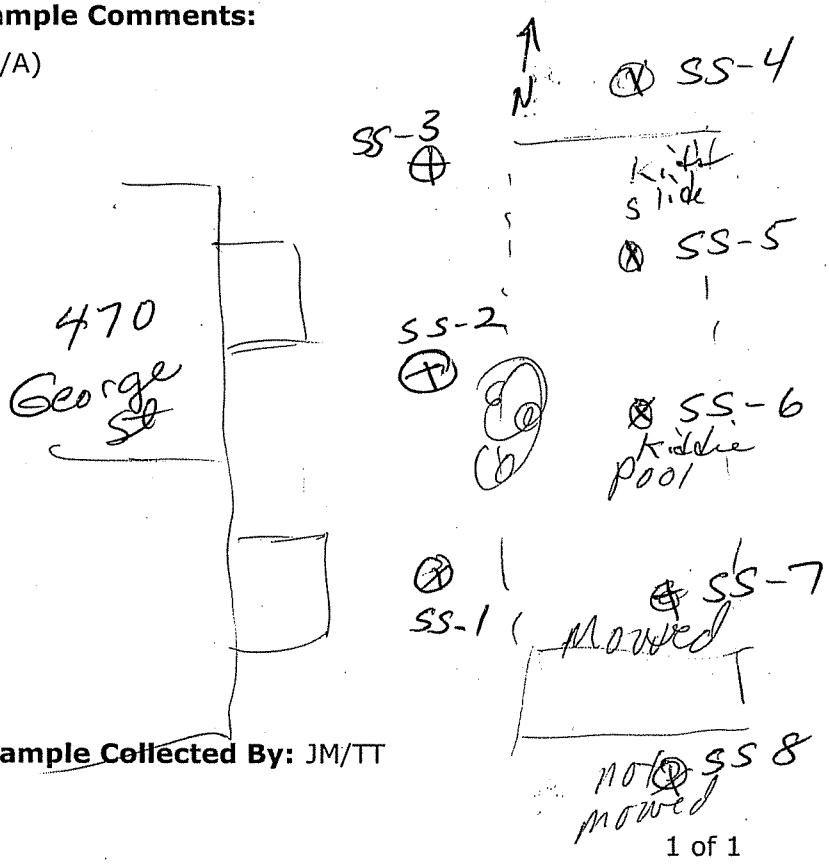
Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: 37.33343 **Sample Collection: Start:** 9/13/11 10:45
Longitude: -92.92294 **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	28 Days	1 Mercury in Soil or Sediment
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP-AES
1 - 8 oz glass	4 Deg C	28 Days	1 Cyanide, Total in Soil
0 -	4 Deg C	0 Days	1 Percent Solid

Sample Comments:
(N/A)



Appx locations

fold

Send data to:
RBS Properties
Attn: Robert Short
PO Box 4582
Springfield MO 65808

602 Katella Cir
Nixon, MO 65714
417-725-8616

Sample Collected By: JM/TT

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 5479 **Sample Number:** 2 **QC Code:** __ **Matrix:** Solid **Tag ID:** 5479-2-__

Project ID: PD07FQ01 **Project Manager:** Paul Doherty
Project Desc: Dugan Helterbrand Post-Removal Assessment
City: Marshfield **State:** Missouri
Program: Superfund
Site Name: 07FQ DUGAN & HELTERBRAND - SITE EVALUATION/DISPOSITION **Site ID:** 07FQ **Site OU:** 00

Location Desc: _____

External Sample Number: SS-8

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: 37.33317 **Sample Collection: Start:** 9/6/11 10:50
Longitude: -92.92284 **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time		Analysis
1 - 8 oz glass	4 Deg C	28	Days	1 Mercury in Soil or Sediment
1 - 8 oz glass	4 Deg C	180	Days	1 Metals in Solids by ICP-AES
1 - 8 oz glass	4 Deg C	28	Days	1 Cyanide, Total in Soil
0 -	4 Deg C	0	Days	1 Percent Solid

Sample Comments:

(N/A)

Data to:
Same as -1

Sample Collected By: JM/TT

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 5479 **Sample Number:** 3 **QC Code:** __ **Matrix:** Solid **Tag ID:** 5479-3-__

Project ID: PD07FQ01 **Project Manager:** Paul Doherty
Project Desc: Dugan Helterbrand Post-Removal Assessment
City: Marshfield **State:** Missouri
Program: Superfund
Site Name: 07FQ DUGAN & HELTERBRAND - SITE EVALUATION/DISPOSITION **Site ID:** 07FQ **Site OU:** 00

Location Desc: _____

External Sample Number: SS-2

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: 37.33327 **Sample Collection: Start:** 9/13/11 10:53
Longitude: -92.92294 **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time		Analysis
1 - 8 oz glass	4 Deg C	28	Days	1 Mercury in Soil or Sediment
1 - 8 oz glass	4 Deg C	180	Days	1 Metals in Solids by ICP-AES
1 - 8 oz glass	4 Deg C	28	Days	1 Cyanide, Total in Soil
0 -	4 Deg C	0	Days	1 Percent Solid

Sample Comments:
(N/A)

Data to:
Same as -1

Sample Collected By: JM/TT

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 5479 **Sample Number:** 4 **QC Code:** __ **Matrix:** Solid **Tag ID:** 5479-4-__

Project ID: PD07FQ01 **Project Manager:** Paul Doherty
Project Desc: Dugan Helterbrand Post-Removal Assessment
City: Marshfield **State:** Missouri
Program: Superfund
Site Name: 07FQ DUGAN & HELTERBRAND - SITE EVALUATION/DISPOSITION **Site ID:** 07FQ **Site OU:** 00

Location Desc: _____

External Sample Number: SS-1

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: 37.33326 **Sample Collection: Start:** 9/13/11 1100
Longitude: 92.92299 **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time		Analysis
1 - 8 oz glass	4 Deg C	28	Days	1 Mercury in Soil or Sediment
1 - 8 oz glass	4 Deg C	180	Days	1 Metals in Solids by ICP-AES
1 - 8 oz glass	4 Deg C	28	Days	1 Cyanide, Total in Soil
0 -	4 Deg C	0	Days	1 Percent Solid

Sample Comments:
(N/A)

Data to:
Same as -1

Sample Collected By: JM/TT

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 5479 **Sample Number:** 5 **QC Code:** __ **Matrix:** Solid **Tag ID:** 5479-5-__

Project ID: PD07FQ01 **Project Manager:** Paul Doherty
Project Desc: Dugan Helterbrand Post-Removal Assessment
City: Marshfield **State:** Missouri
Program: Superfund
Site Name: 07FQ DUGAN & HELTERBRAND - SITE EVALUATION/DISPOSITION **Site ID:** 07FQ **Site OU:** 00

Location Desc: _____

External Sample Number: SS-3

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: 37.33338 **Sample Collection: Start:** 9/13/11 1102
Longitude: -92.92304 **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time		Analysis
1 - 8 oz glass	4 Deg C	28	Days	1 Mercury in Soil or Sediment
1 - 8 oz glass	4 Deg C	180	Days	1 Metals in Solids by ICP-AES
1 - 8 oz glass	4 Deg C	28	Days	1 Cyanide, Total in Soil
0 -	4 Deg C	0	Days	1 Percent Solid

Sample Comments:

(N/A)

Data to:
Same as -1

Sample Collected By: JM/TT

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 5479 **Sample Number:** 6 **QC Code:** __ **Matrix:** Solid **Tag ID:** 5479-6-__

Project ID: PD07FQ01 **Project Manager:** Paul Doherty
Project Desc: Dugan Helterbrand Post-Removal Assessment
City: Marshfield **State:** Missouri
Program: Superfund
Site Name: 07FQ DUGAN & HELTERBRAND - SITE EVALUATION/DISPOSITION **Site ID:** 07FQ **Site OU:** 00

Location Desc: _____

External Sample Number: SS-6

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: 37.33328 **Sample Collection: Start:** 9/13/11 11:09
Longitude: -92.92290 **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time		Analysis
1 - 8 oz glass	4 Deg C	28	Days	1 Mercury in Soil or Sediment
1 - 8 oz glass	4 Deg C	180	Days	1 Metals in Solids by ICP-AES
1 - 8 oz glass	4 Deg C	28	Days	1 Cyanide, Total in Soil
0 -	4 Deg C	0	Days	1 Percent Solid

Sample Comments:
(N/A)

Duplicate:
Same as -1

Sample Collected By: JM/TT

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 5479 **Sample Number:** 7 **QC Code:** __ **Matrix:** Solid **Tag ID:** 5479-7-__

Project ID: PD07FQ01 **Project Manager:** Paul Doherty
Project Desc: Dugan Helterbrand Post-Removal Assessment
City: Marshfield **State:** Missouri
Program: Superfund
Site Name: 07FQ DUGAN & HELTERBRAND - SITE EVALUATION/DISPOSITION **Site ID:** 07FQ **Site OU:** 00

Location Desc: _____

External Sample Number: SS-5

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: 37.33333 **Sample Collection: Start:** 9/13/4 11:11
Longitude: 92.92290 **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time		Analysis
1 - 8 oz glass	4 Deg C	28	Days	1 Mercury in Soil or Sediment
1 - 8 oz glass	4 Deg C	180	Days	1 Metals in Solids by ICP-AES
1 - 8 oz glass	4 Deg C	28	Days	1 Cyanide, Total in Soil
0 -	4 Deg C	0	Days	1 Percent Solid

Sample Comments:
(N/A)

Data to:
Same as -1

Sample Collected By: JM/TT

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 5479 **Sample Number:** 8 **QC Code:** __ **Matrix:** Solid **Tag ID:** 5479-8-__

Project ID: PD07FQ01 **Project Manager:** Paul Doherty
Project Desc: Dugan Helterbrand Post-Removal Assessment
City: Marshfield **State:** Missouri
Program: Superfund
Site Name: 07FQ DUGAN & HELTERBRAND - SITE EVALUATION/DISPOSITION **Site ID:** 07FQ **Site OU:** 00

Location Desc: _____

External Sample Number: SS-7

Expected Conc: (or Circle One: Low Medium High)

		Date	Time(24 hr)
Latitude: 37.33326	**Sample Collection: Start:**	9/13/11	11:16
Longitude: -92.92290	**End:**	__/__/__	__:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	28 Days	1 Mercury in Soil or Sediment
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP-AES
1 - 8 oz glass	4 Deg C	28 Days	1 Cyanide, Total in Soil
0 -	4 Deg C	0 Days	1 Percent Solid

Sample Comments:
(N/A)

Data to:
Same as -1

Sample Collected By: JM/TT

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 5479 **Sample Number:** 9 **QC Code:** __ **Matrix:** Solid **Tag ID:** 5479-9-__

Project ID: PD07FQ01 **Project Manager:** Paul Doherty
Project Desc: Dugan Helterbrand Post-Removal Assessment
City: Marshfield **State:** Missouri
Program: Superfund
Site Name: 07FQ DUGAN & HELTERBRAND - SITE EVALUATION/DISPOSITION **Site ID:** 07FQ **Site OU:** 00

Location Desc: _____

External Sample Number: SS-9 (BKG)

Expected Conc: (or Circle One: Low Medium High)

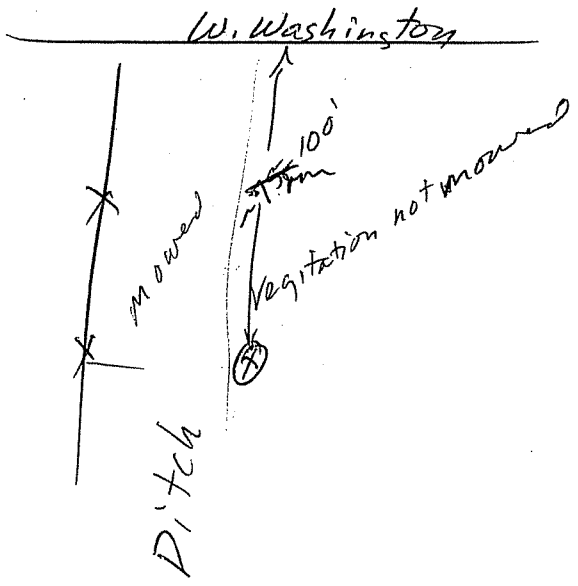
		Date	Time(24 hr)
Latitude: 37.33518	**Sample Collection: Start:**	9/13/11	11:35
Longitude: -92.92276	**End:**	__/__/__	__:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	28 Days	1 Mercury in Soil or Sediment
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP-AES
1 - 8 oz glass	4 Deg C	28 Days	1 Cyanide, Total in Soil
0 -	4 Deg C	0 Days	1 Percent Solid

Sample Comments:

(N/A)



Sample Collected By: JM/TT

APPENDIX E

TRANSMITTAL OF SAMPLE ANALYSIS RESULTS FOR ASR # 5479

United States Environmental Protection Agency
Region 7
901 N. 5th Street
Kansas City, KS 66101

Date: 10/18/2011

Subject: Transmittal of Sample Analysis Results for ASR #: 5479

Project ID: PD07FQ01

Project Description: Dugan Helterbrand Post-Removal Assessment

From: Michael F. Davis, Chief
Chemical Analysis and Response Branch, Environmental Services Division

To: Paul Doherty
SUPR/ERSB

Enclosed are the analytical data for the above-referenced Analytical Services Request (ASR) and Project. The Regional Laboratory has reviewed and verified the results in accordance with procedures described in our Quality Manual (QM). In addition to all of the analytical results, this transmittal contains pertinent information that may have influenced the reported results and documents any deviations from the established requirements of the QM.

Please contact us within 14 days of receipt of this package if you determine there is a need for any changes. Please complete the enclosed Customer Satisfaction Survey and Data Disposition/Sample Release memo for this ASR as soon as possible. The process of disposing of the samples for this ASR will be initiated 30 days from the date of this transmittal unless an alternate release date is specified on the Data Disposition/Sample Release memo.

If you have any questions or concerns relating to this data package, contact our customer service line at 913-551-5295.

Enclosures

cc: Analytical Data File.

Project Manager: Paul Doherty Org: SUPR/ERSB Phone: 913-551-7924

Project ID: PD07FQ01

Project Desc: Dugan Helterbrand Post-Removal Assessment

Location: Marshfield State: Missouri Program: Superfund

Site Name: 07FQ DUGAN & HELTERBRAND - SITE EVALUATION/DISPOSITION Site ID: 07FQ Site OU: 00

GPRA PRC: 303DC6

Purpose: Site Characterization

Post removal sampling of properties near the former Dugan Helterbrand site to determine if residual contamination of soil is present

Explanation of Codes, Units and Qualifiers used on this report

Sample QC Codes: QC Codes identify the type of sample for quality control purpose.

__ = Field Sample

Units: Specific units in which results are reported.

mg/kg = Milligrams per Kilogram

% = Percent

Data Qualifiers: Specific codes used in conjunction with data values to provide additional information on the quality of reported results, or used to explain the absence of a specific value.

(Blank) = Values have been reviewed and found acceptable for use.

U = The analyte was not detected at or above the reporting limit.

UJ = The analyte was not detected at or above the reporting limit. The reporting limit is an estimate.

J = The identification of the analyte is acceptable; the reported value is an estimate.

ASR Number: 5479 Sample Information Summary 10/18/2011

Project ID: PD07FQ01 Project Desc: Dugan Helterbrand Post-Removal Assessment

Sample No	QC Code	Matrix	Location Description	External Sample No	Start Date	Start Time	End Date	End Time	Receipt Date
1 -	__	Solid	SS-4		09/13/2011	10:45			09/14/2011
2 -	__	Solid	SS-8		09/13/2011	10:50			09/14/2011
3 -	__	Solid	SS-2		09/13/2011	10:53			09/14/2011
4 -	__	Solid	SS-1		09/13/2011	11:00			09/14/2011
5 -	__	Solid	SS-3		09/13/2011	11:02			09/14/2011
6 -	__	Solid	SS-6		09/13/2011	11:09			09/14/2011
7 -	__	Solid	SS-5		09/13/2011	11:11			09/14/2011
8 -	__	Solid	SS-7		09/13/2011	11:16			09/14/2011
9 -	__	Solid	SS-9 (Background)		09/13/2011	11:35			09/14/2011

Analysis Comments About Results For This Analysis

1 Cyanide, Total in Soil

Lab: Region 7 EPA Laboratory - Kansas City, Ks.

Method: EPA Region 7 RLAB Method 3135.2J used to determine 'Total' results.

Basis: Dry

Samples: 1-__ 2-__ 3-__ 4-__ 5-__ 6-__ 7-__
8-__ 9-__

Comments:

1 Mercury in Soil or Sediment

Lab: Region 7 EPA Laboratory - Kansas City, Ks.

Method: EPA Region 7 RLAB Method 3121.23B

Basis: Dry

Samples: 1-__ 2-__ 3-__ 4-__ 5-__ 6-__ 7-__
8-__ 9-__

Comments:
(N/A)

1 Metals in Solids by ICP-AES

Lab: Region 7 EPA Laboratory - Kansas City, Ks.

Method: EPA Region 7 RLAB Method 3122.3D

Basis: Dry

Samples: 1-__ 2-__ 3-__ 4-__ 5-__ 6-__ 7-__
8-__ 9-__

Comments:
Antimony was UJ-coded in sample 1. This analyte was not found in the sample at or above the reporting limit, however, the reporting limit is an estimate (UJ-coded) due to low recovery of this analyte in the laboratory matrix spike. The actual reporting limit for this analyte may be higher than the reported value.

Cadmium was J-coded in sample 1. Although the analyte in question has been positively identified in the sample, the quantitation is an estimate (J-coded) due to high recovery of this analyte in the laboratory matrix spike. The actual concentration for this analyte may be lower than the reported value.

Slight Aluminum contamination was found in the laboratory method blank. Only samples containing this analyte at a level greater than ten times the contamination level of the blank are reported without being qualified. All samples that contained this analyte but at a level less than ten times the contamination in the blank have the result U-coded indicating that the reporting limit has been raised to the level found in the sample. No samples were affected.

Analysis	Comments About Results For This Analysis

Samples 1-9 were diluted 1:2 for the following analytes: Barium, Beryllium, Chromium, Iron, Lead, Manganese, Vanadium, Zinc, Cobalt, Nickel, Cadmium, Thallium & Silver. As a result the reporting limit for these elements was raised by a factor of 2.

1 Percent Solid

Lab: Region 7 EPA Laboratory - Kansas City, Ks.

Method: EPA Region 7 RLAB Method 3142.9F

Basis: N/A

Samples: 1-__ 2-__ 3-__ 4-__ 5-__ 6-__ 7-__
8-__ 9-__

Comments:
(N/A)

Analysis/ Analyte	Units	1-__	2-__	3-__	4-__
1 Cyanide, Total in Soil					
Cyanide	mg/kg	0.390 U	0.254 U	0.525 U	0.352 U
1 Mercury in Soil or Sediment					
Mercury	mg/kg	0.0819	0.0742	0.0375	0.0309
1 Metals in Solids by ICP-AES					
Aluminum	mg/kg	13400	9950	12700	13500
Antimony	mg/kg	2.4 UJ	2.1 U	2.0 U	2.0 U
Arsenic	mg/kg	5.9 U	6.8	5.1 U	5.1 U
Barium	mg/kg	143	111	114	116
Beryllium	mg/kg	2.4 U	2.1 U	2.0 U	2.0 U
Cadmium	mg/kg	33.4 J	37.9	37.2	35.7
Calcium	mg/kg	9600	5200	8590	4850
Chromium	mg/kg	18.6	24.1	30.4	22.7
Cobalt	mg/kg	8.0	9.6	14.0	11.7
Copper	mg/kg	20.6	17.0	7.1	15.8
Iron	mg/kg	13800	16400	17500	15500
Lead	mg/kg	49.4	37.5	26.2	23.0
Magnesium	mg/kg	2060	1400	5490	3100
Manganese	mg/kg	712	725	805	782
Molybdenum	mg/kg	2.4 U	2.1 U	2.0 U	2.0 U
Nickel	mg/kg	8.5	6.5	7.0	9.0
Potassium	mg/kg	1490	1220	1030	1330
Selenium	mg/kg	11.8 U	10.6 U	10.1 U	10.2 U
Silver	mg/kg	4.7 U	4.2 U	4.0 U	4.1 U
Sodium	mg/kg	76.5	52.9 U	50.6 U	51.2 U
Thallium	mg/kg	23.7 U	21.2 U	20.2 U	20.5 U
Vanadium	mg/kg	24.9	29.1	31.9	27.3
Zinc	mg/kg	87.5	80.4	23.8	31.3
1 Percent Solid					
Solids, percent	%	82.1	91.6	95.3	96.7

Analysis/ Analyte	Units	5-__	6-__	7-__	8-__
1 Cyanide, Total in Soil					
Cyanide	mg/kg	0.396 U	0.457 U	0.436 U	0.359 U
1 Mercury in Soil or Sediment					
Mercury	mg/kg	0.0229	0.0660	0.0669	0.0771
1 Metals in Solids by ICP-AES					
Aluminum	mg/kg	13200	10800	11500	10800
Antimony	mg/kg	2.0 U	2.1 U	2.2 U	2.2 U
Arsenic	mg/kg	5.1 U	5.2 U	5.4 U	7.6
Barium	mg/kg	101	130	138	120
Beryllium	mg/kg	2.0 U	2.1 U	2.2 U	2.2 U
Cadmium	mg/kg	32.3	31.7	31.0	46.6
Calcium	mg/kg	21600	7310	6840	5570
Chromium	mg/kg	18.3	15.5	17.6	37.7
Cobalt	mg/kg	10.1	8.9	7.5	10.2
Copper	mg/kg	6.7	18.2	20.0	17.4
Iron	mg/kg	14900	13200	13100	19000
Lead	mg/kg	20.0	33.9	36.6	38.2
Magnesium	mg/kg	13600	1600	1790	1430
Manganese	mg/kg	676	761	748	878
Molybdenum	mg/kg	2.0 U	2.1 U	2.2 U	2.2 U
Nickel	mg/kg	7.3	7.5	7.8	7.6
Potassium	mg/kg	1280	1160	1170	1130
Selenium	mg/kg	10.2 U	10.4 U	10.8 U	10.9 U
Silver	mg/kg	4.1 U	4.2 U	4.3 U	4.3 U
Sodium	mg/kg	52.6	63.2	80.7	54.4 U
Thallium	mg/kg	20.5 U	20.9 U	21.6 U	21.7 U
Vanadium	mg/kg	25.6	21.5	22.4	38.3
Zinc	mg/kg	26.4	62.8	74.1	62.0
1 Percent Solid					
Solids, percent	%	94.2	92.0	91.4	91.4

Analysis/ Analyte	Units	9-__
1 Cyanide, Total in Soil		
Cyanide	mg/kg	0.488 U
1 Mercury in Soil or Sediment		
Mercury	mg/kg	0.0566
1 Metals in Solids by ICP-AES		
Aluminum	mg/kg	17200
Antimony	mg/kg	2.2 U
Arsenic	mg/kg	5.9
Barium	mg/kg	157
Beryllium	mg/kg	2.2 U
Cadmium	mg/kg	47.6
Calcium	mg/kg	6040
Chromium	mg/kg	22.2
Cobalt	mg/kg	14.3
Copper	mg/kg	19.2
Iron	mg/kg	21500
Lead	mg/kg	73.3
Magnesium	mg/kg	2280
Manganese	mg/kg	423
Molybdenum	mg/kg	2.2 U
Nickel	mg/kg	19.5
Potassium	mg/kg	1650
Selenium	mg/kg	11.2 U
Silver	mg/kg	4.5 U
Sodium	mg/kg	56.1 U
Thallium	mg/kg	22.4 U
Vanadium	mg/kg	27.4
Zinc	mg/kg	117
1 Percent Solid		
Solids, percent	%	86.0

United States Environmental Protection Agency
Region VII
901 N. 5th Street
Kansas City, KS 66101

Date: __/__/____

Subject: Data Disposition/Sample Release for ASR #: 5479

Project ID: PD07FQ01

Project Description: Dugan Helterbrand Post-Removal Assessment

From: Paul Doherty
SUPR/ERSB

To: Kaye Dollmann
ENSV/CARB

I have received and reviewed the Transmittal of Sample Analysis Results for the above-referenced Analytical Services Request(ASR) and have indicated my findings below by checking one of the boxes for Data Disposition.

I understand all samples will be disposed upon receipt of this form, unless samples are requested to be held. If I do not return this form all samples will be disposed of on _____.

☐ "RELEASED" - Read-only to all Region 7 employees and contractors that have R7LIMS "Customer" account. All Samples may be disposed of upon receipt of this form if not requested to be held.

☐ "Project Manager Accessible" - Available on the LAN in R7LIMS for my use only. All Samples may be disposed of upon receipt of this form if not requested to be held.

☐ "Archived" - THIS DATA IS OF A SENSITIVE NATURE. Any future reports must be requested through the laboratory. All samples may be disposed of upon receipt of the form if not requested to be held.

☐ Hold Samples - I have determined that the samples need to be held until _____, after which time they will be disposed of in accordance with applicable regulations.
The reason for the hold is:

- ☐ Samples are associated with a legal proceeding.
- ☐ Question/Concern with data - possible reanalysis requested.
- ☐ Other:_____

APPENDIX F

REMOVAL SITE EVALUATION FORM

SUPERFUND REMOVAL SITE EVALUATION
and
REMOVAL PRELIMINARY ASSESSMENT

I. SITE NAME AND LOCATION:

NAME: Dugan & Helterbrand (D&H); MOD86919248 (Archived)

ADDRESS OR OTHER LOCATION IDENTIFIER: George Street (2011 post-removal sampling conducted at 470 George Street residence, about 150 feet northeast of former D&H facility)

CITY: Marshfield	**STATE:** MO	**ZIP:** 65706

DIRECTIONS TO SITE: Interstate 44 to Marshfield, MO; take Marshfield exit, Spur 38, southeast into town. Turn right (southwest) onto State Highway 00 (W. Washington St.), then take first left (about 600 feet) onto George St. The former Dugan & Helterbrand facility is accessed by a roadway on the east side of George Street between duplex at 490/492 George Street and Marshfield Drayage trucking company at 500 George Street. This access road is east of the intersection of George Street and Warren Avenue. The residence where the 2011 post-removal sampling was conducted (470 George Street) is the third duplex north of the access road to the former D&H facility.
MAP ATTACHED: Yes

II. PROGRAM CONTACTS:

REQUESTED BY: Paul Doherty	**DATE OF REQUEST:** June 8, 2011	
AGENCY/OFFICE: U.S. EPA Region 7 Superfund Division		
MAILING ADDRESS: 901 N. 5th Street		
CITY: Kansas City	**STATE:** Kansas	**ZIP:** 66101
TELEPHONE: (913) 551-7924	**FAX:** (913) 551-7948	
EVALUATOR: Jenna Mead		
AGENCY/OFFICE: Tetra Tech EM, Inc.		
MAILING ADDRESS: 415 Oak Street		
CITY: Kansas City, MO	**STATE:** MO	**ZIP:** 64106
TELEPHONE: 816-412-1741	**FAX:** 816-410-1748	

III. REMOVAL SITE EVALUATION CRITERIA [40 CFR 300.410(e)]:

IS THERE A RELEASE AS DEFINED BY THE NCP: **YES** ☐ **or NO** ☒

EXPLAIN: Based on post-removal soil sampling conducted in September 2011, it appears no off-site release to the 470 George Street residence has occurred.

*(A **RELEASE** is defined as any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment (including the abandonment of barrels, containers, and other closed receptacles containing any hazardous substances or pollutant or contaminant), but excludes: workplace exposures; engine exhaust emissions; nuclear releases otherwise regulated; and the normal application of fertilizer. For purposes of the NCP, release also means threat of release.)*

IS THE SOURCE A FACILITY OR VESSEL AS DEFINED BY THE NCP: **YES** ☐ **or NO** ☐ **NA** ☒

EXPLAIN: Because no off-site release to the 470 George Street residence was identified, a source cannot be defined.

*(A **FACILITY** is defined as any building, structure, installation, equipment, pipe or pipeline (including any pipe into a sewer or POTW), well, pit, pond, lagoon, impoundment, ditch, landfill, storage container, motor vehicle, rolling stock, or aircraft or any site or area, where a hazardous substance has been deposited, stored, disposed of, or placed, or otherwise come to be located; but does not include any consumer product in consumer use or any vessel. A **VESSEL** is defined as any description of watercraft or other artificial contrivance used, or capable of being used, as a means of transportation on water other than a public vessel.)*

SUPERFUND REMOVAL SITE EVALUATION
and
REMOVAL PRELIMINARY ASSESSMENT

DOES THE RELEASE INVOLVE A HAZARDOUS SUBSTANCE, OR POLLUTANT OR CONTAMINANT AS DEFINED BY THE NCP: **YES ☐ or NO ☐ NA ☒**
EXPLAIN: No off-site release to the 470 George Street residence was identified.

*(A **HAZARDOUS SUBSTANCE** means any substance, element, compound, mixture, solution, hazardous waste, toxic pollutant, hazardous air pollutant, or imminently hazardous chemical substance or mixture designated pursuant to the CWA, CERCLA, SDWA, CAA or TSCA. The term does not include petroleum products, natural gas, natural gas liquids, liquefied natural gas, synthetic gas or mixtures of natural and synthetic gas. The definition of **POLLUTANT or CONTAMINANT** includes, but is not limited to, any element, substance, compound, or mixture, including disease-causing agents, which after release into the environment and upon exposure, ingestion, inhalation, or assimilation into any organism, either directly from the environment or indirectly by ingestion through food chains, will or may reasonably be anticipated to cause death, disease, behavioral abnormalities, cancer, genetic mutation, physiological malfunctions or physical deformations, in such organisms or their offspring. The term does not include petroleum products, natural gas, natural gas liquids, liquefied natural gas, synthetic gas or mixtures of natural and synthetic gas).*

IS THE RELEASE SUBJECT TO THE LIMITATIONS ON RESPONSE: **YES ☐ or NO ☐ NA ☒**
EXPLAIN: No off-site release to the 470 George Street residence was identified.

*(The **LIMITATIONS ON RESPONSE** provisions of the NCP (40 CFR 300.400(B) states that removals shall not be undertaken in response to a release: of a naturally occurring substance in its unaltered or natural form; from products that are a part of the structure of, and result in exposure within, residential buildings or business or community structures; or into public or private drinking water supplies due to deterioration of the system through ordinary use.)*

DOES THE QUANTITY OR CONCENTRATION WARRANT RESPONSE: **YES ☐ or NO ☒**
EXPLAIN:

HAS A PRP BEEN IDENTIFIED: **YES ☐ or NO ☐ NA ☒**
EXPLAIN: No off-site release to the 470 George Street residence was identified.

IV. CONDITIONS TO WARRANT REMOVAL [40 CFR 300.415(b)(2)]:

ACTUAL OR POTENTIAL EXPOSURE TO HAZARDOUS SUBSTANCES, POLLUTANTS, OR CONTAMINANTS: **YES ☐ or NO ☒**
EXPLAIN:

ACTUAL OR POTENTIAL CONTAMINATION OF DRINKING WATER SUPPLIES: **YES ☐ or NO ☒**
EXPLAIN:

HAZARDOUS SUBSTANCES, POLLUTANTS, OR CONTAMINANTS IN DRUMS, BARRELS,OR BULK STORAGE CONTAINERS: **YES ☐ or NO ☒**
EXPLAIN:

HIGH LEVELS OF HAZARDOUS SUBSTANCES, POLLUTANTS, OR CONTAMINANTS IN NEAR-SURFACE SOILS: **YES ☐ or NO ☒**
EXPLAIN:

CONDITIONS SUSCEPTIBLE TO IMPACT FROM ADVERSE WEATHER CONDITIONS: **YES ☐ or NO ☒**
EXPLAIN:

THREAT OF FIRE OR EXPLOSION: **YES ☐ or NO ☒**
EXPLAIN:

SUPERFUND REMOVAL SITE EVALUATION
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POTENTIAL FOR OTHER FEDERAL OR STATE RESPONSE MECHANISMS: **YES ☐ or NO ☒**
EXPLAIN:

OTHER SITUATIONS OR FACTORS WHICH POSE A THREAT: **YES ☐ or NO ☒**
EXPLAIN:

V. POTENTIAL REMOVAL ACTIONS [40 CFR 300.415(d)]:

(NOTE: The following identifies potential removal actions which may be determined to be appropriate pending further review and study. The proposed actions should be considered preliminary proposals and are subject to change.)

SITE SECURITY: **YES ☐ or NO ☒**
EXPLAIN:

DRAINAGE CONTROL: **YES ☐ or NO ☒**
EXPLAIN:

STABILIZATION OR REMOVAL OF SURFACE IMPOUNDMENTS: **YES ☐ or NO ☒**
EXPLAIN:

CAPPING OF CONTAMINATED SOIL: **YES ☐ or NO ☒**
EXPLAIN:

USE OF CHEMICALS TO CONTROL/RETARD SPREAD OF CONTAMINATION: **YES ☐ or NO ☒**
EXPLAIN:

CONTAMINATED SOIL EXCAVATION: **YES ☐ or NO ☒**
EXPLAIN:

REMOVAL OF DRUMS, TANKS, OR BULK STORAGE CONTAINERS: **YES ☐ or NO ☒**
EXPLAIN:

CONTAINMENT, TREATMENT, OR DISPOSAL OF HAZARDOUS SUBSTANCES, POLLUTANTS,OR CONTAMINANTS: **YES ☐ or NO ☒**
EXPLAIN:

PROVIDE ALTERNATIVE WATER SUPPLIES: **YES ☐ or NO ☒**
EXPLAIN:

SUPERFUND REMOVAL SITE EVALUATION
and
REMOVAL PRELIMINARY ASSESSMENT

VI. REMOVAL SITE EVALUATION DETERMINATION AND REMOVAL PRELIMINARY ASSESSMENT FINDINGS AND RECOMMENDATIONS:

☒ **REMOVAL NOT WARRANTED—REMOVAL SITE EVALUATION TERMINATED**

(Cite one or more of the criteria from SECTION III. REMOVAL SITE EVALUATION CRITERIA, as the basis for the above determination.)

	☒	**NOT A RELEASE**	☐	**NOT A FACILITY OR VESSEL**
	☐	**NOT A HAZARDOUS SUBSTANCE OR POLLUTANT OR CONTAMINANT**	☐	**SUBJECT TO RESPONSE LIMITATIONS**
	☐	**INSUFFICIENT QUANTITY OR CONCENTRATION**	☐	**WILLING/CAPABLE PRP IDENTIFIED**

COMMENT: Grab samples of 0-2 inch surface soils at the 470 George Street residence were collected and analyzed for metals and cyanide. No cyanide or metals of concern were detected.

☐ **REMOVAL RECOMMENDED [☐EMERGENCY ☐TIME-CRITICAL ☐NON-TIME-CRITICAL]**

(Cite one or more of the conditions or factors from Section IV. CONDITIONS TO WARRANT A REMOVAL ACTION, as a basis for recommend that a removal action be conducted.)

	☐	**EXPOSURE TO HAZARDOUS SUBSTANCES OR POLLUTANTS OR CONTAMINANTS**			☐	**ADVERSE WEATHER IMPACTS**
	☐	**CONTAMINATED DRINKING WATER**	☐	**FIRE/EXPLOSION THREAT**	☐	**CONTAMINATED SOIL**
	☐	**DRUMS, BARRELS OR CONTAINERS**	☐	**NO OTHER RESPONSE MECHANISM**	☐	**OTHER FACTORS**

(Identify one or more of the removal actions listed in Section V. REMOVAL ACTIONS WHICH MAY BE APPROPRIATE, as examples of the types of response actions which are recommended.)

	☐	**SITE SECURITY**	☐	**DRAINAGE CONTROL**	☐	**IMPOUNDMENT STABILIZATION**
	☐	**REMOVAL OF DRUMS, BARRELS, ETC.**	☐	**SOIL CAPPING**	☐	**SOIL EXCAVATION**
	☐	**CONTAIN/TREAT/DISPOSE OF WASTES**	☐	**CHEMICAL CONTROLS**	☐	**ALT. DRINKING WATER SUPPLIES**

COMMENT:

☐ **ADDITIONAL REMOVAL SITE EVALUATION RECOMMENDED**

(Cite one or more of the conditions or factors from Section IV. CONDITIONS TO WARRANT A REMOVAL ACTION, as a basis for recommending that additional site evaluation be performed.)

	☐	**EXPOSURE TO HAZARDOUS SUBSTANCES OR POLLUTANTS OR CONTAMINANTS**			☐	**ADVERSE WEATHER IMPACTS**
	☐	**CONTAMINATED DRINKING WATER**	☐	**FIRE/EXPLOSION THREAT**	☐	**CONTAMINATED SOIL**
	☐	**DRUMS, BARRELS OR CONTAINERS**	☐	**NO OTHER RESPONSE MECHANISM**	☐	**OTHER FACTORS**

(Identify one or more of the removal actions listed in Section V. REMOVAL ACTIONS WHICH MAY BE APPROPRIATE, as examples of the types of response actions which may be appropriate pending the results of further site evaluation.)

	☐	**SITE SECURITY**	☐	**DRAINAGE CONTROL**	☐	**IMPOUNDMENT STABILIZATION**
	☐	**REMOVAL OF DRUMS, BARRELS, ETC.**	☐	**SOIL CAPPING**	☐	**SOIL EXCAVATION**
	☐	**CONTAIN/TREAT/DISPOSE OF WASTE**	☐	**CHEMICAL CONTROLS**	☐	**ALTERNATIVE DRINKING WATER SUPPLIES**

COMMENT:

SUPERFUND REMOVAL SITE EVALUATION
and
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VII. ADDITIONAL INFORMATION OR COMMENTS:

EPA USE ONLY

VIII. CERTIFICATION:

SIGNATURE: **DATE:**
POSITION/TITLE:
OFFICE/AGENCY:

SUPERFUND REMOVAL SITE EVALUATION
and
REMOVAL PRELIMINARY ASSESSMENT
(Supplemental Waste Inventory Sheet)

IX. HAZARDOUS SUBSTANCES, POLLUTANTS OR CONTAMINANT INFORMATION:

MATERIAL DESCRIPTION	CONTAINER INFORMATION					
TRADE NAME/ACTIVE INGREDIENTS	NUMBER of CONTAINERS	SIZE	TYPE	SOLID or LIQUID	% FULL	CONDITION